

Appl. No. 10/708,642
Amdt. dated April 13, 2006
Reply to Office action of February 13, 2006

REMARKS/ARGUMENTS

Reconsideration of the present application is politely requested. Applicants believe that this application is now in condition of allowance. Applicants respectfully
5 request that a timely Notice of Allowance be issued in this case.

Claim 1 was rejected under 35 U.S.C. 103(a), for reasons of record that can be found on pages 3-4 in the Office action identified above, which is Part of Paper No./Mail Date 1205. Claim 1 was rejected by the Examiner under 103 as being unpatentable over
10 Hong et al. (US 6,429,057) in view of Rioux (US 5,554,488).

Rioux teaches a method of forming a semiconductor structure based on a lift-off masking process. After providing a weakly bonded surface layer on the substrate, a multilayer masking layer stack is deposited, and patterned to define an opening with undercut sidewalls. The multilayer masking stack forms a heat resistant mask for high temperature deposition of one or more conductive layers, e.g. sputtered metals to form a gate metal stack for a FET. The undercut sidewalls of the mask create a discontinuity in the deposited metal layers. Preferential etching of the deposited metal layers occurs at the discontinuity, resulting in separation of the gate metal structure and the excess metal overlying the masking layers. The weakly bonded surface layer on the substrate controls the adhesion of the overlying masking layers, and allows for the excess metal and the underlying masking layers to be separated from the substrate simply by a liftoff process (See FIGS. 4-10 and col. 6, line 50-col. 8, line 25).

25 The disclosed method for forming the tungsten layer 48 with tapered sidewalls is quite different from the claimed invention of this application. Rioux does not teach "forming a patterned photoresist on said molybdenum-containing metal layer, wherein

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said patterned photoresist defines a gate and word line array pattern", as required in claim 1. The Examiner has stated no motivation that would cause one reasonably skilled in the art to modify Rioux reference. There is nothing that the applicants can find in the Rioux reference that would serve as motivation.

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It is respectfully suggested that, in light of the above, none of the cited references, alone or in combination, teaches or makes obvious all of the limitations of the amended claim 1. Reconsideration of claim 1 is therefore politely requested. As Claims 2-12 are dependent upon claim 1, they should be allowable if claim 1 is allowed. Reconsideration 10 of claims 2-12 is therefore politely requested.

Claim 13 was rejected under 35 U.S.C. 102(e), for reasons of record that can be found on page 2 in the Office action identified above, which is Part of Paper No./Mail Date 1205. Claim 13 was rejected by the Examiner under 102 because of Hong reference.

15 Claim 16 is rejected under 103 as being unpatentable over Hong and Rioux references and in view of Hori reference (US 5,445,710).

Hori teaches a dry-etching method comprising the steps of forming carbon film on a substrate to be etched, forming a resist pattern on the carbon thin film, selectively 20 etching the carbon film using the resist pattern as a mask by a plasma of a gas mixture of a gas containing fluorine atoms and a gas containing oxygen atoms which are mixed at an atomic ratio of fluorine to oxygen of 198:1 to 1:2 so as to form a carbon film pattern, and selectively etching said substrate to be etched using the carbon film pattern as a mask or the resist pattern and the carbon film pattern as masks. According to Hori's teaching, this 25 method is merely applicable to the etching of carbon film or resist film. The applicants submit that Hori fails to disclose a molybdenum-containing metal layer.

The applicants believe that the amended claim 13 is allowable because none of the

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cited references, alone or in combination, teaches or makes obvious all of the limitations of "etching said molybdenum-containing metal layer by using fluorine/oxygen containing gas mixture containing SF₆/O₂ with a ratio of about 700sccm/300sccm, and using said patterned photoresist as an etching mask to form said gate and word line array pattern", as

5 required by the amended claim 13.

As Claims 14-15 and 17-20 are dependent upon claim 1, they should be allowable if claim 13 is allowed. Reconsideration of claims 14-15 and 17-20 is therefore politely requested.

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Sincerely yours,

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